ABSTRACT

METHOD OF MAKING MAGNETIC HEAD HAVING NARROW POLE TIP AND FINE PITCH COIL

The magnetic head of the present invention includes a narrow, high aspect ratio P2 pole tip and a high aspect ratio, fine pitch induction coil. Electroplating trenches for the P2 pole tip and the induction coil are fabricated in a single RIE process step, and the P2 pole tip and the induction coil are thereafter separately plated up into their respective trenches to complete the fabrication of these structures.

Briefly, following the fabrication of a P1 pole and the deposition of an insulation layer thereon, a patterned P2 pole tip seed layer is deposited. Significantly, the pole tip seed layer is not deposited beneath the induction coil area of the magnetic head. A dielectric layer is next deposited and a patterned RIE etching mask is fabricated upon the dielectric layer. The etching mask pattern includes both a P2 pole tip trench opening and an induction coil trench opening. Thereafter, in a single RIE etching step, the P2 pole tip trench is etched through the dielectric material down to the seed layer, and the induction coil trench is etched through the dielectric material down to the insulation layer. The P2 pole tip is then electroplated up into its trench, and no electroplating occurs within the induction coil trench because no seed layer has been yet deposited therein. Following the electroplating of the P2 pole tip, an induction coil seed layer is deposited upon the wafer surface and specifically down into the induction coil trench. Thereafter, the induction coil is electroplated up into the induction coil trench. A chemical mechanical polishing (CMP) step is next conducted to remove the excess induction coil material and the RIE etching mask. Thereafter, a patterned insulation layer is deposited upon the induction coil, which is followed by the fabrication of a P2 pole yoke thereupon. Further

fabrication steps as are known to those skilled in the art are thereafter accomplished to complete the magnetic head of the present invention.